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Keil & Weinkauff
1350 Connecticut Avenue NW
Washington, DC 20036

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| EXAMINER |
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PAK, YONG D

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| ART UNIT | PAPER NUMBER |
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1652

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,146

Applicant(s)

HAUER ET AL.

Examiner

Yong D. Pak

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-8, 13, 14, 16 and 19-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 10, 12, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This application is a 371 of PCT/EP00/07253.

The amendment filed on January 28, 2005, amending claims 12 and 17, has been entered.

Claims 1-10, 12-14 and 16-24 are pending. Claims 1-8, 13-14, 16 and 19-24 are withdrawn. Claims 9-10, 12 and 17-18 are under consideration.

Response to Arguments

In view of the supplemental appeal brief filed on January 28, 2005, PROSECUTION IS HEREBY REOPENED. New grounds of objection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Objections

Claim 17 is objected to because said claims depend from non-elected claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the phrase "is derived from cytochrome P450 monooxygenase BM-3 from *Bacillus megaterium*". The metes and bounds of this phrase are not clear to the Examiner. Literally, while the term "derived" means "to isolate from or obtain from a source", the above term could also mean "to arrive at by reasoning i.e., to deduce or infer" or also as "to produce or obtain from another substance". Therefore, it is not clear to the Examiner either from the specification or from the claims as to what applicants mean by the above phrase. It is not clear to the Examiner whether the monooxygenase is "derived from *Bacillus megaterium*" encompasses a single specific enzyme (SEQ ID NO:2), as in isolated from *Bacillus megaterium*, or whether it encompasses recombinants, variants and mutants of the cytochrome P450 monooxygenase of SEQ ID NO:2 or modified P450 monooxygenase from any other source and labeled as a cytochrome P450 monooxygenase "derived from *Bacillus megaterium*". As applicants have not provided a definition for the above phrase, Examiner has interpreted the

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claims broadly to mean that a cytochrome P450 monooxygenase "derived from *Bacillus megaterium*" encompasses polypeptides which are recombinants, variants or mutants of any cytochrome P450 monooxygenase. Examiner has given the same interpretation while considering the claims for all other rejections. The rejection can be overcome by amending the phrase to recite "wherein cytochrome P450 monooxygenase is isolated from *Bacillus megaterium*".

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the phrase "an amino acid sequence according to SEQ ID NO:2". The metes and bounds of this phrase in the context of the above claim are not clear to the Examiner. It is not clear whether the polypeptide comprises a fragment of SEQ ID NO:2 or the full length of the amino acid sequence of SEQ ID NO:2. A perusal of the specification did not provide the Examiner with a specific definition for the above phrase. As applicants have not provided a definition for the above phrase, Examiner has interpreted the claims broadly to mean that a monooxygenase comprising "an amino acid according to SEQ ID NO:2" encompasses fragments of SEQ ID NO:2. Examiner requests clarification of the above phrase and suggests amending the claim by replacing "an" with "the" in the above phrase.

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the phrase "according to". The metes and bounds of the phrase in the context of the claims are not clear. It is not clear to the Examiner if the recited amino acid sequence has the amino acid sequence of SEQ ID NO:2 or is a representative member of a genus. Examiner suggests amending the phrase as "the amino acid sequence of SEQ ID NO:2" to clearly indicate that the polypeptide has the amino acid sequence of SEQ ID NO:2.

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the phrase "intermediately formed substrate". The metes and bounds of this phrase are not clear to the Examiner. The method encompasses any N-heterocyclic mono or polynuclear aromatic substrates or any S-heterocyclic mono or polynuclear aromatic substrates formed "intermediately". It is unclear to the Examiner if the method involves a step of forming these substrates by any means. In the context of the above, Examiner takes the position that these claims are incomplete for omitting essential steps, such omission amounting to a gap between the steps and the claim is incomplete for omitting essential elements, such omission amounting to a gap between the elements. The omitted steps are: steps in converting any compounds to any N-

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heterocyclic mono or polynuclear aromatic compounds or any S-heterocyclic mono or polynuclear aromatic compounds. The omitted elements are: enzymes or chemical agents or compounds necessary to "form" any compounds to any N-heterocyclic mono or polynuclear aromatic compounds or any S-heterocyclic mono or polynuclear aromatic compounds.

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the phrase "secondary product thereof". The metes and bounds of this phrase are not clear to the Examiner. The method encompasses isolating any secondary products of the oxidized product. It is unclear to the Examiner if the method involves a step of separating these products by any means such that a single product is purified or if the method is directed to always obtaining a mixture of these products. In the context of the above, Examiner takes the position that the claim is incomplete for omitting essential steps, such omission amounting to a gap between the steps and these claims are incomplete for omitting essential elements, such omission amounting to a gap between the elements. The omitted steps are: steps in converting or separating the "secondary product" of the product of the monooxygenase reaction. The omitted elements are: enzymes or chemical agents necessary to convert or separate the "secondary product".

Claim 9 and claims 10, 12 and 17-18 depending therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the phrase "functional mutation". The metes and bounds of this phrase are not clear to the Examiner. A perusal of the specification did not provide the Examiner with a specific definition for the above phrase. Therefore, it is not clear to the Examiner either from the specification or from the claim as to what type of mutations are encompassed in a "functional mutation". Examiner requests clarification of the above phrase.

Claims 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17-18 recite the phrase "wherein, as exogenous substrate". The metes and bounds of this phrase are not clear to the Examiner. Literally, the phrase means a "like" or "similar" to an "exogenous substrate". Therefore, it is not clear to the Examiner either from the specification or from the claims as to what applicants mean by the above phrase. It appear that applicants have meant to recite "wherein the exogenous substrate is selected from..". Examiner requests clarification of the above phrase.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9-10, 12 and 17-18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 9-10, 12 and 17-18 are drawn to a method of oxidizing N- or S-0 heterocyclic mono- or polynuclear aromatic compounds using cytochrome P450 monooxygenase derived from SEQ ID NO:2 and comprising at least one mutation in at least one of the regions recited in claim 9. Since the claim recites the language "at least functional mutation in at least one of the amino acid sequence regions", it is interpreted as any single or any number of mutations in at least one of the recited regions. Further, the claims are not limited to a variant of SEQ ID NO:2 consisting of mutations at the recited regions, but to any variant or mutant of SEQ ID NO:2 comprising of mutations at the recited regions and any other mutations at other regions. The limitation of comprising "at least functional mutation in at least one of the amino acid sequence regions" provides no description on the structure of other parts of the enzyme. Thus the claims encompass a method of oxidizing any or all N- or S-0 heterocyclic mono- or polynuclear aromatic compounds using any variants, mutants and recombinants of SEQ ID NO:2 comprising any number of mutations at the recited regions and in other regions. Therefore, the claims are drawn to a method of oxidizing a genus of N- or S-0 heterocyclic mono- or polynuclear aromatic compounds having any structure using any or all cytochrome P450 monooxygenase derived from SEQ ID NO:2, including any or all

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recombinants, mutants and variants, including those that comprise mutations at the recited regions. The specification only describes one representative species, a method for oxidizing indoles with a modified cytochrome P450 monooxygenase of SEQ ID NO:2 having mutations at residue Phe87Val, Phe87Val and Leu 188Gln, or Phe87Val, Leu188Gln and Ala74Gly expressed in a host cell comprising a polynucleotide encoding said modified monooxygenases. One species is not enough and does not constitute a representative number of species to describe the whole genus and there is no evidence on the record of the relationship between the structure of indoles and the structure of any or all N- or S-0 heterocyclic mono- or polynuclear aromatic compounds. Similarly, there is no evidence on the record of the relationship between the structure of SEQ ID NO:2 and the structure of any cytochrome P450 monooxygenase derived from SEQ ID NO:2, including any or all recombinants, variants and mutants. Therefore, the specification fails to describe a representative species of the genus comprising any or all variants, mutants or recombinants of SEQ ID NO:2 used in the method of oxidizing a genus of any or all N- or S-0 heterocyclic mono- or polynuclear aromatic compounds.

Given this lack of description of the representative species encompassed by the genus of the claims, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that applicants were in possession of the inventions of claims 9-10, 12 and 17-18.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claims 9-10, 12 and 17-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of microbiological oxidation of N-or S-heterocyclic mono or polynuclear aromatic compounds by using a modified cytochrome P450 monooxygenase of SEQ ID NO:2 having a Phe87Val, Phe87Val and Leu 188Gln, or Phe87Val, Leu188Gln and Ala74Gly substitution with indole as a substrate, does not reasonably provide enablement for A) a method for oxidation of any or all N-or S-heterocyclic mono or polynuclear aromatic compounds and B) a method for oxidation of any or all N-or S-heterocyclic mono or polynuclear aromatic compounds with any modified P450 monooxygenase having one or more functional mutation in one of the regions corresponding to 172-224, 39-43, 48-52, 67-70, 330-335, 352-356, 73-82 and 86-88 of SEQ ID NO:2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Factors to be considered in determining whether undue experimentation is required, are summarized in *In re Wands* (858 F.2d 731, 8 USPQ 2nd 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s).

Claims 9-10, 12 and 17 are drawn to a method for the oxidation of any or all N-or S-heterocyclic mono or polynuclear aromatic compounds with any modified cytochrome

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P450 monooxygenase derived from *Bacillus megaterium* having one more functional mutation in one or more of the regions corresponding to residues 172-224, 39-43, 48-52, 67-70, 330-335, 352-356, 73-82 and 86-88 of SEQ ID NO:2, which amounts substituting 1 to 91 amino acids, or a modified cytochrome P450 monooxygenase with SEQ ID NO:2 having a Phe87Val, Phe87Val and Leu 188Gln, or Phe87Val, Leu188Gln and Ala74Gly substitution. Claim 18 is drawn to a method for the oxidation of an indole with a modified cytochrome P450 monooxygenase derived from *Bacillus megaterium* having one more functional mutation in one or more of the regions corresponding to residues 172-224, 39-43, 48-52, 67-70, 330-335, 352-356, 73-82 and 86-88 of SEQ ID NO:2. Therefore, the claims encompass a method for the oxidation of any or all N-or S-heterocyclic mono or polynuclear aromatic compounds using a modified cytochrome P450 monooxygenase derived from *Bacillus megaterium* having a large number of amino acid substitution, resulting in an enzyme that oxidizes heterocyclic or mono or polynuclear aromatic compounds.

The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of N-or S-heterocyclic mono or polynuclear aromatic compounds and P450 monooxygenase variants and mutants, broadly encompassed by the method of the claims. The claims encompass compounds with widely varying structure and properties. However, in this case the disclosure is limited to a method for oxidizing indoles with a modified cytochrome P450 monooxygenase of SEQ ID NO:2 having mutations at residue Phe87Val, Phe87Val and Leu 188Gln, or Phe87Val, Leu188Gln and Ala74Gly expressed in a host cell comprising

a polynucleotide encoding said modified monooxygenases. It would require undue experimentation of the skilled artisan to oxidize any N-or S-heterocyclic mono or polynuclear aromatic compounds.

Further, since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to a method for oxidizing an indole with a modified cytochrome P450 monooxygenase of SEQ ID NO:2 having mutations at residue Phe87Val, Phe87Val and Leu 188Gln, or Phe87Val, Leu188Gln and Ala74Gly expressed in a host cell comprising a polynucleotide encoding said modified monooxygenases. It would require undue experimentation of the skilled artisan to make and use the claimed variants and mutants of any P450 monooxygenases. In view of the great breadth of the claim, amount of experimentation required to make the claimed polynucleotides, the lack of guidance, working examples, and unpredictability of the art in predicting function from a polypeptide primary structure, the claimed invention would require undue experimentation. As such, the specification fails to teach one of ordinary skill how to use the full scope of the polypeptides encompassed by this claim.

While enzyme isolation techniques, recombinant and mutagenesis techniques are known, and it is routine in the art to screen for multiple substitutions or multiple

modifications as encompassed by the instant claims, the specific amino acid positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass a method for the oxidation of any or all any N-or S-heterocyclic mono or polynuclear aromatic compounds using any or all mutants and variants of any P450 monooxygenase, because the specification does not establish: (A) amino acids of any P450 monooxygenase which may be modified without affecting P450 monooxygenase activity and having an altered substrate specificity, i.e. oxidizing N-or S-heterocyclic mono or polynuclear aromatic compounds; (B) the general tolerance of P450 monooxygenase to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any amino acid residue with an expectation of obtaining the desired biological function; (D) any or all any N-or S-heterocyclic mono or polynuclear aromatic compounds which are oxidized by a modified P450 monooxygenases; (E) a rational and predictable scheme for selecting any N-or S-heterocyclic mono or polynuclear aromatic compounds with an expectation of obtaining oxidized any N-or S-heterocyclic mono or polynuclear aromatic compounds by incubating said substrates with a modified P450 monooxygenase; and (F) the

specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including a method for the production of any or all any N-or S-heterocyclic mono or polynuclear aromatic compounds using any or all variants and mutants of any P450 monooxygenase. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of mutants and variants of any P450 monooxygenase having the desired biological characteristics recited in the claim is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

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directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 9-10, 12 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Wong et al.

Claims 9-10, 12 and 17 are drawn to a method of oxidizing N-or S-heterocyclic mono or polynuclear aromatic compounds with a modified cytochrome P450 monooxygenase derived from *Bacillus megaterium* having a mutation corresponding to residue 87 of SEQ ID NO:2. (See the rejection of "derived from *Bacillus megaterium*" under 35 U.S. C. 112, 2nd paragraph above).

Wong et al. (GB 2 294 692 - form PTO-1449) discloses a method of oxidizing N-heterocyclic polynuclear aromatic compound with a modified cytochrome P450 monooxygenase having a mutation corresponding to residue 87 of SEQ ID NO:2. (abstract and pages 4 and 14). Since applicants do not place any limitation on the structure of the monooxygenase derived from SEQ ID NO:2, Examiner takes the position that the monooxygenase of Wong et al. is a cytochrome P450 monooxygenase that is "derived from *Bacillus megaterium*". Therefore, the reference of Wong et al. anticipates claims 9-10, 12 and 17.

Claims 9-10, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Wong et al.

Claims 9-10, 12 and 17 are drawn to a method of oxidizing N-or S-heterocyclic mono or polynuclear aromatic compounds with a modified cytochrome P450 monooxygenase derived from *Bacillus megaterium* having a mutation corresponding to residue 87 of SEQ ID NO:2. (See the rejection of "derived from *Bacillus megaterium*" under 35 U.S. C. 112, 2nd paragraph above).

Wong et al. (U.S. Patent No. 6,100,074 - form PTO-1449) discloses a method of oxidizing N-heterocyclic polynuclear aromatic compound with a modified cytochrome P450 monooxygenase having a mutation corresponding to residue 87 of SEQ ID NO:2. (abstract and pages 4 and 14). Since applicants do not place any limitation on the structure of the monooxygenase derived from SEQ ID NO:2, Examiner takes the position that the monooxygenase of Wong et al. is a cytochrome P450 monooxygenase that is "derived from *Bacillus megaterium*". Therefore, the reference of Wong et al. anticipates claims 9-10, 12 and 17.

None of the claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Pak whose telephone number is 571-272-0935. The examiner can normally be reached 6:30 A.M. to 5:00 P.M. Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on 571-272-0928. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 703-872-9307 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1600.

Yong D. Pak
Patent Examiner 1652



PONNATHAPU ACHUTAMURTHY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1650